

34. (New) A frame structure for a communication system, each frame having 15 slots and each slot having N number of pilot bits, where  $2 \leq N \leq 16$ , such that there are N number of pilot bit patterns of 15 bits in the frame, wherein the improvement comprises N number of pilot bit patterns having at least one of the following pilot bit patterns:

Slot No	1	2	3	4	.....	15
Pilot bit pattern 1 =	1	0	0	0	1	1 1 1 0 1 0 1 1 0 0
Pilot bit pattern 2 =	1	0	1	0	0	1 1 0 1 1 1 0 0 0 0
Pilot bit pattern 3 =	1	1	0	0	0	1 0 0 1 1 0 1 0 1 1
Pilot bit pattern 4 =	0	0	1	0	1	0 0 0 0 1 1 1 0 1 1
Pilot bit pattern 5 =	1	1	1	0	1	0 1 1 0 0 1 0 0 0 1
Pilot bit pattern 6 =	1	1	0	1	1	1 0 0 0 0 1 0 1 0 0
Pilot bit pattern 7 =	1	0	0	1	1	0 1 0 1 1 1 1 0 0 0
Pilot bit pattern 8 =	0	0	0	0	1	1 1 0 1 1 0 0 1 0 1

wherein any one of the pilot bit patterns allows at least one of channel estimation and frame synchronization.

35. (New) A frame structure for an uplink Dedicated Physical Control Channel (DPCCH) in a communication system, wherein the improvement comprises each frame of the uplink DPCCH having 15 slots and  $N_{\text{pilot}}$  number of pilot bits in each slot, where  $3 \leq N_{\text{pilot}} \leq 8$  and pilot bit patterns comprise at least one of the following based on  $N_{\text{pilot}}$  number of pilot bits:

Bit #	when $N_{\text{pilot}} = 5$					when $N_{\text{pilot}} = 6$					
	0	1	2	3	4	0	1	2	3	4	5
Slot #0	1	1	1	1	0	1	1	1	1	1	0
1	0	0	1	1	0	1	0	0	1	1	0
2	0	1	1	0	1	1	0	1	1	0	1
3	0	0	1	0	0	1	0	0	1	0	0
4	1	0	1	0	1	1	1	0	1	0	1
5	1	1	1	1	0	1	1	1	1	1	0
6	1	1	1	0	0	1	1	1	1	0	0
7	1	0	1	0	0	1	1	0	1	0	0
8	0	1	1	1	0	1	0	1	1	1	0
9	1	1	1	1	1	1	1	1	1	1	1
10	0	1	1	0	1	1	0	1	1	0	1
11	1	0	1	1	1	1	1	0	1	1	1
12	1	0	1	0	0	1	1	0	1	0	0
13	0	0	1	1	1	1	0	0	1	1	1
14	0	0	1	1	1	1	0	0	1	1	1

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*Subst. cont.*

*B1 Cont.*

Bit #	when $N_{\text{pilot}} = 7$							when $N_{\text{pilot}} = 8$							
	0	1	2	3	4	5	6	0	1	2	3	4	5	6	7
Slot #0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
1	1	0	0	1	1	0	1	1	0	1	0	1	1	1	0
2	1	0	1	1	0	1	1	1	0	1	1	1	0	1	1
3	1	0	0	1	0	0	1	1	0	1	0	1	0	1	0
4	1	1	0	1	0	1	1	1	1	1	0	1	0	1	1
5	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
6	1	1	1	1	0	0	1	1	1	1	1	1	0	1	0
7	1	1	0	1	1	0	1	1	1	1	0	1	1	1	0
8	1	0	1	1	1	0	1	1	0	1	1	1	1	1	0
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	0	1	1	0	1	1	1	0	1	1	1	0	1	1
11	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1
12	1	1	0	1	0	0	1	1	1	1	0	1	0	1	0
13	1	0	0	1	1	1	1	1	0	1	0	1	1	1	1
14	1	0	0	1	1	1	1	1	0	1	0	1	1	1	1

wherein shaded pilot bit patterns allow at least one of channel estimation and frame synchronization.

36. (New) A frame structure for a Random Access Channel (RACH) in a communication system, wherein the improvement comprises each frame of the RACH having 15 slots and  $N_{\text{pilot}}$  number of pilot bits in each slot, where  $N_{\text{pilot}}=8$ , and pilot bit patterns comprise

*Sub B2 cont.*

*B1 Cont.*

		$N_{\text{pilot}} = 8$							
Bit #		0	1	2	3	4	5	6	7
Slot #0	1	1	1	1	1	1	1	1	0
1	1	1	0	1	0	1	1	1	0
2	1	1	0	1	1	1	0	1	1
3	1	1	0	1	0	1	0	1	0
4	1	1	1	1	0	1	0	1	1
5	1	1	1	1	1	1	1	1	0
6	1	1	1	1	1	1	0	1	0
7	1	1	1	1	0	1	0	1	0
8	1	1	0	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1
10	1	1	0	1	1	1	0	1	1
11	1	1	1	1	0	1	1	1	1
12	1	1	1	1	0	1	0	1	0
13	1	1	0	1	0	1	1	1	1
14	1	1	0	1	0	1	1	1	1

wherein shaded pilot bit patterns allow at least one of channel estimation and frame synchronization.

bits:

	when $N_{\text{pilot}} = 2$	when $N_{\text{pilot}} = 4$		when $N_{\text{pilot}} = 8$				when $N_{\text{pilot}} = 16$							
Symbol #	0	0	1	0	1	2	3	0	1	2	3	4	5	6	7
Slot #0	11	11	11	11	11	11	10	11	11	11	10	11	11	11	10
1	00	11	00	11	00	11	10	11	00	11	10	11	11	11	00
2	01	11	01	11	01	11	01	11	01	11	01	11	10	11	00
3	00	11	00	11	00	11	00	11	00	11	00	11	01	11	10
4	10	11	10	11	10	11	01	11	10	11	01	11	11	11	11
5	11	11	11	11	11	11	10	11	11	11	10	11	01	11	01
6	11	11	11	11	11	11	00	11	11	11	00	11	10	11	11
7	10	11	10	11	10	11	00	11	10	11	00	11	10	11	00
8	01	11	01	11	01	11	10	11	01	11	10	11	00	11	11
9	11	11	11	11	11	11	11	11	11	11	11	11	00	11	11
10	01	11	01	11	01	11	01	11	01	11	01	11	11	11	10
11	10	11	10	11	10	11	11	11	10	11	11	11	00	11	10
12	10	11	10	11	10	11	00	11	10	11	00	11	01	11	01
13	00	11	00	11	00	11	11	11	00	11	11	11	00	11	00
14	00	11	00	11	00	11	11	11	00	11	11	11	10	11	01

wherein shaded pilot bit patterns allow at least one of channel estimation and frame synchronization.

38. (New) A frame structure for a downlink Dedicated Physical Control Channel (DPCCH) using Space Time Transmit Diversity (STTD) encoding in a communication system, wherein the improvement comprises each frame of the downlink DPCCH having 15 slots and  $N_{\text{pilot}}$  number of pilot bits in each slot, where  $2 \leq N_{\text{pilot}} \leq 16$ , and pilot bit patterns comprise at least one of the following based on  $N_{\text{pilot}}$  number of pilot bits:

	when $N_{\text{pilot}} = 4$		when $N_{\text{pilot}} = 8$				when $N_{\text{pilot}} = 16$							
Symbol #	0	1	0	1	2	3	0	1	2	3	4	5	6	7
Slot #0	01	10	11	00	00	10	11	00	00	10	11	00	00	10
1	10	10	11	00	00	01	11	00	00	01	11	10	00	10
2	11	10	11	11	00	00	11	11	00	00	11	10	00	11
3	10	10	11	10	00	01	11	10	00	01	11	00	00	00
4	00	10	11	11	00	11	11	11	00	11	11	01	00	10
5	01	10	11	00	00	10	11	00	00	10	11	11	00	00
6	01	10	11	10	00	10	11	10	00	10	11	01	00	11
7	00	10	11	10	00	11	11	10	00	11	11	10	00	11
8	11	10	11	00	00	00	11	00	00	00	11	01	00	01
9	01	10	11	01	00	10	11	01	00	10	11	01	00	01
10	11	10	11	11	00	00	11	11	00	00	11	00	00	10
11	00	10	11	01	00	11	11	01	00	11	11	00	00	01
12	00	10	11	10	00	11	11	10	00	11	11	11	00	00
13	10	10	11	01	00	01	11	01	00	01	11	10	00	01
14	10	10	11	01	00	01	11	01	00	01	11	11	00	11

wherein shaded pilot bit patterns allow at least one channel estimation and frame synchronization.

39. (New) A frame structure for a Secondary Common Control Physical Channel (S-CCPCH) in a communication system, wherein the improvement comprises each frame of the S-CCPCH having 15 slots and  $N_{\text{pilot}}$  number of pilot bits in each slot, where  $8 \leq N_{\text{pilot}} \leq 16$ , and pilot bit patterns comprise at least one of the following based on  $N_{\text{pilot}}$  number of pilot bits:

Symbol #	when $N_{\text{pilot}} = 8$				when $N_{\text{pilot}} = 16$							
	0	1	2	3	0	1	2	3	4	5	6	7
Slot #0	11	11	11	10	11	11	11	10	11	11	11	10
1	11	00	11	10	11	00	11	10	11	11	11	00
2	11	01	11	01	11	01	11	01	11	10	11	00
3	11	00	11	00	11	00	11	00	11	01	11	10
4	11	10	11	01	11	10	11	01	11	11	11	11
5	11	11	11	10	11	11	11	10	11	01	11	01
6	11	11	11	00	11	11	11	00	11	10	11	11
7	11	10	11	00	11	10	11	00	11	10	11	00
8	11	01	11	10	11	01	11	10	11	00	11	11
9	11	11	11	11	11	11	11	11	11	00	11	11
10	11	01	11	01	11	01	11	01	11	11	11	10
11	11	10	11	11	11	10	11	11	11	00	11	10
12	11	10	11	00	11	10	11	00	11	01	11	01
13	11	00	11	11	11	00	11	11	11	00	11	00
14	11	00	11	11	11	00	11	11	11	10	11	01

wherein shaded pilot bit patterns allow at least one channel estimation and frame synchronization.

40. (New) A frame structure for a Secondary Common Control Physical Channel (S-CCPCH) using Space Time Transmit Diversity (STTD) encoding in a communication system, wherein the improvement comprises each frame of the S-CCPCH having 15 slots and  $N_{\text{pilot}}$  number of pilot bits in each slot, where  $8 \leq N_{\text{pilot}} \leq 16$ , and pilot bit patterns comprise at least one of the following based on  $N_{\text{pilot}}$  number of pilot bits:

Symbol #	$N_{\text{pilot}} = 8$				$N_{\text{pilot}} = 16$							
	0	1	2	3	0	1	2	3	4	5	6	7
Slot #0	11	00	00	10	11	00	00	10	11	00	00	10
1	11	00	00	01	11	00	00	01	11	10	00	10
2	11	11	00	00	11	11	00	00	11	10	00	11
3	11	10	00	01	11	10	00	01	11	00	00	00
4	11	11	00	11	11	11	00	11	11	01	00	10
5	11	00	00	10	11	00	00	10	11	11	00	00
6	11	10	00	10	11	10	00	10	11	01	00	11
7	11	10	00	11	11	10	00	11	11	10	00	11
8	11	00	00	00	11	00	00	00	11	01	00	01
9	11	01	00	10	11	01	00	10	11	01	00	01
10	11	11	00	00	11	11	00	00	11	00	00	10
11	11	01	00	11	11	01	00	11	11	00	00	01
12	11	10	00	11	11	10	00	11	11	11	00	00
13	11	01	00	01	11	01	00	01	11	10	00	01
14	11	01	00	01	11	01	00	01	11	11	00	11

wherein shaded pilot bit patterns allow at least one channel estimation and frame synchronization.